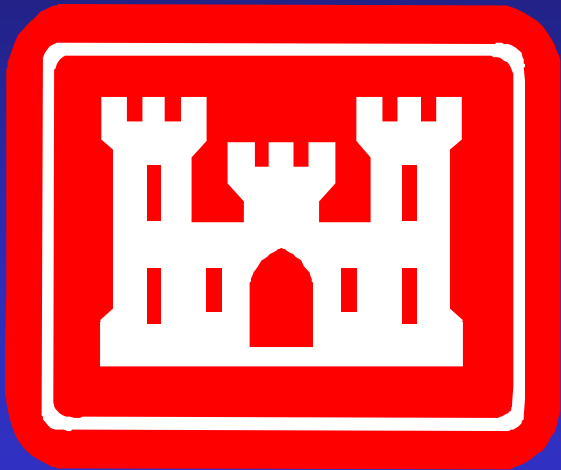


# Assessment of Sediment Resuspension by Vessel Traffic









ADCP in  
raised position

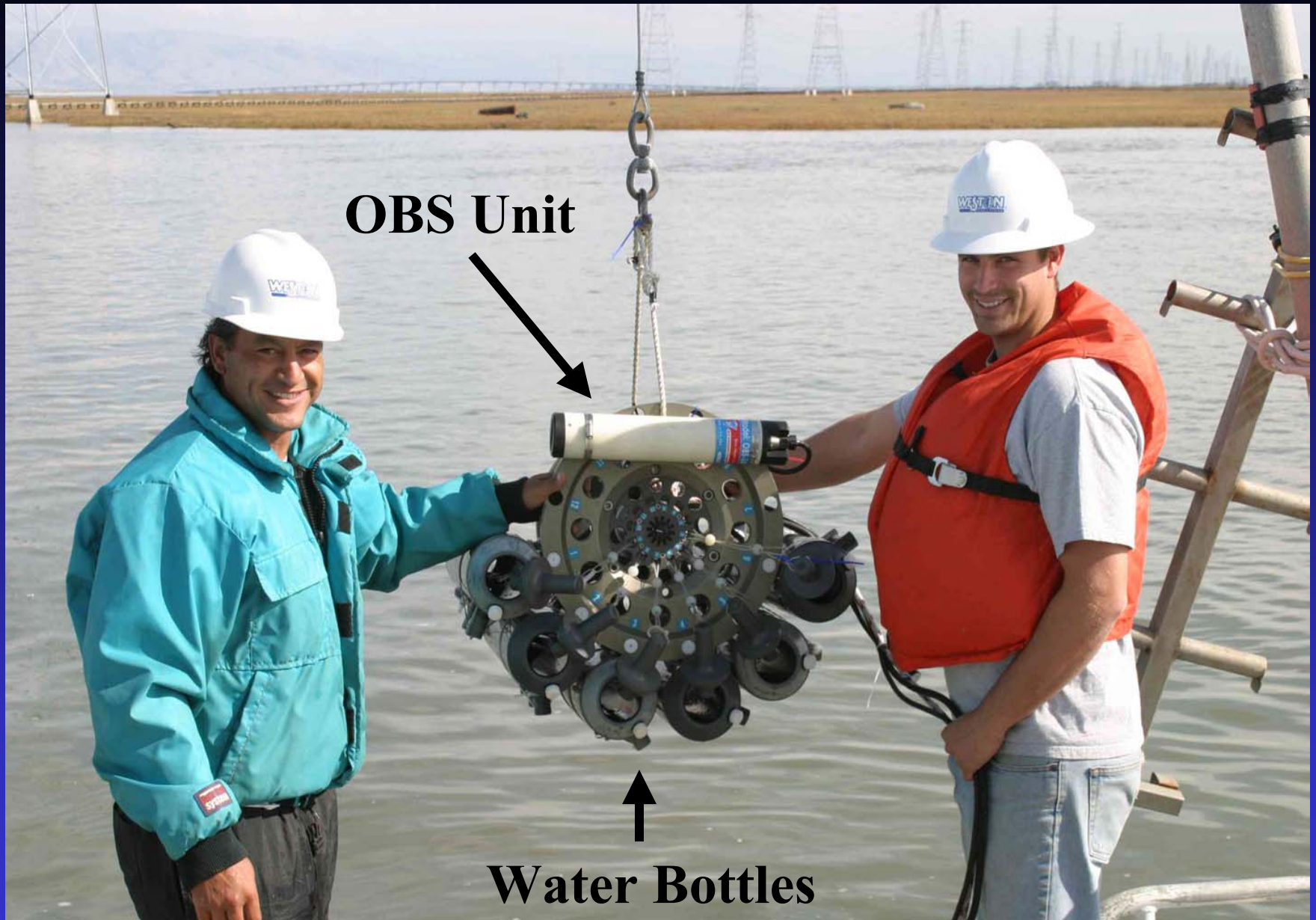
A photograph showing an ADCP (Acoustic Doppler Current Profiler) mounted on a metal frame, positioned in its raised position. The ADCP is a blue and white cylindrical device with four red circular sensors. It is mounted on a metal frame that is part of a larger structure, likely a boat. The background shows a body of water and a bridge in the distance.



Deployed

A photograph showing the ADCP mounted on a metal frame, positioned in its deployed position. The ADCP is a blue and white cylindrical device with four red circular sensors. It is mounted on a metal frame that is part of a larger structure, likely a boat. The background shows a body of water and a bridge in the distance.

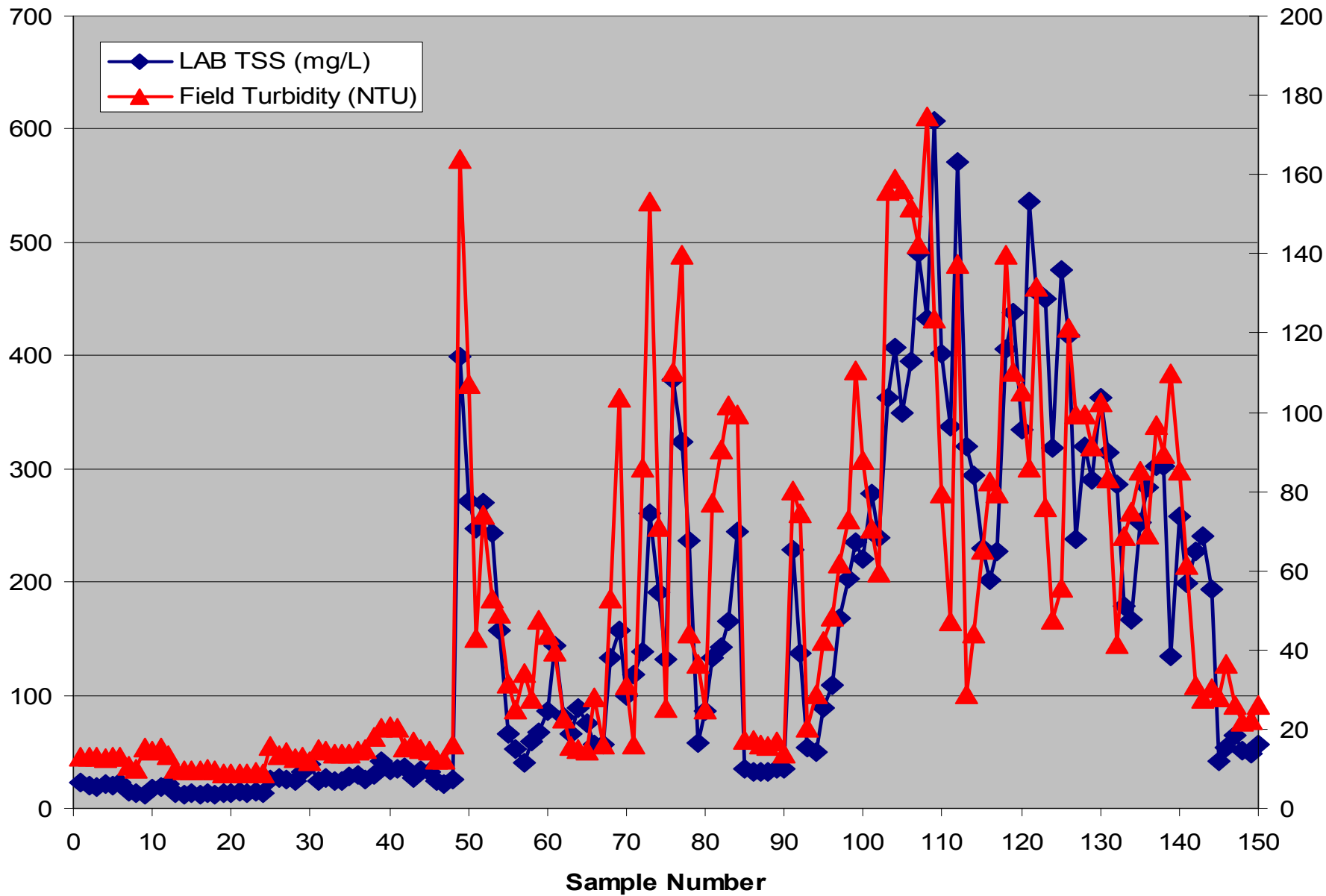




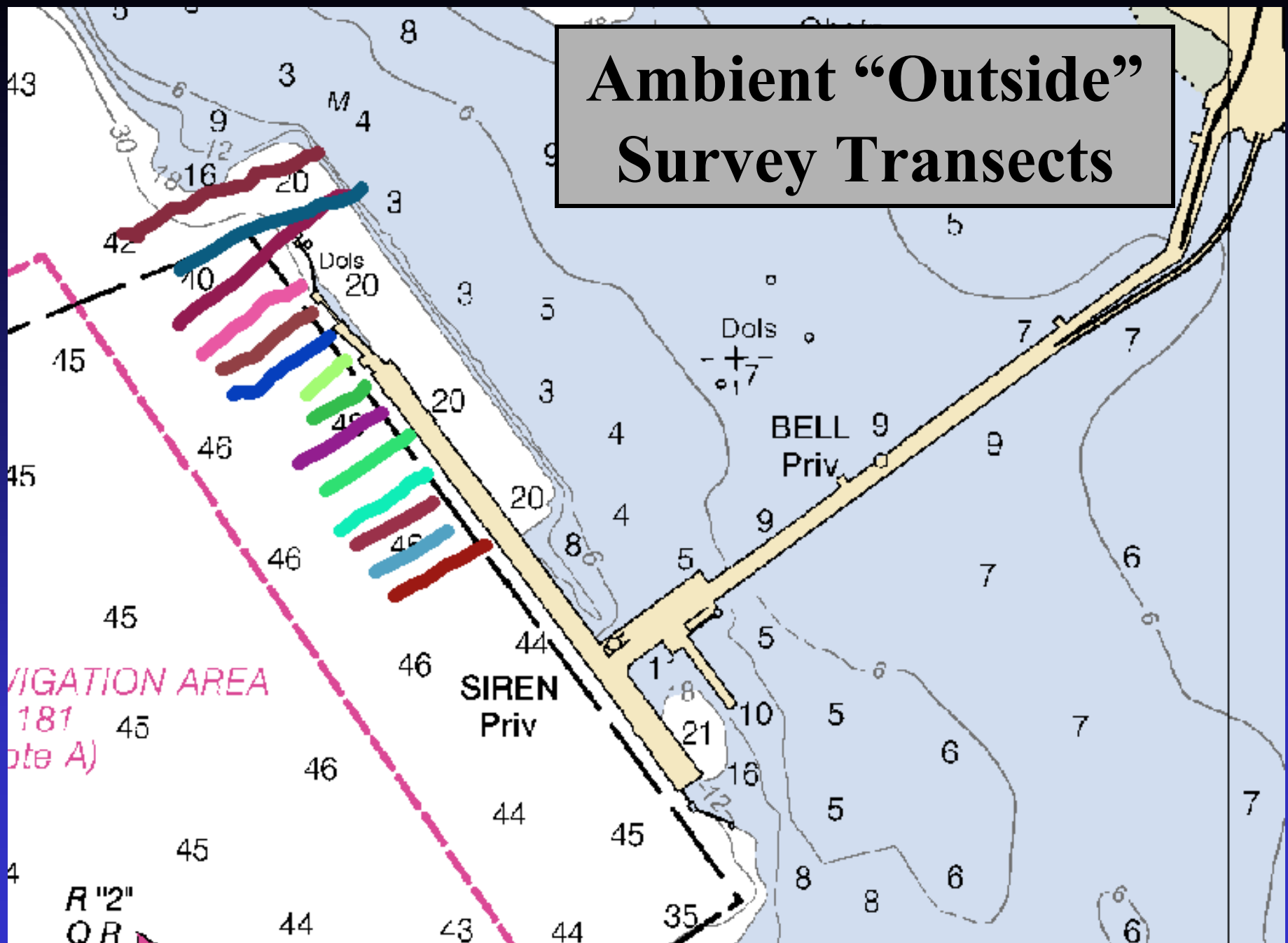
**OBS Unit**



**Water Bottles**



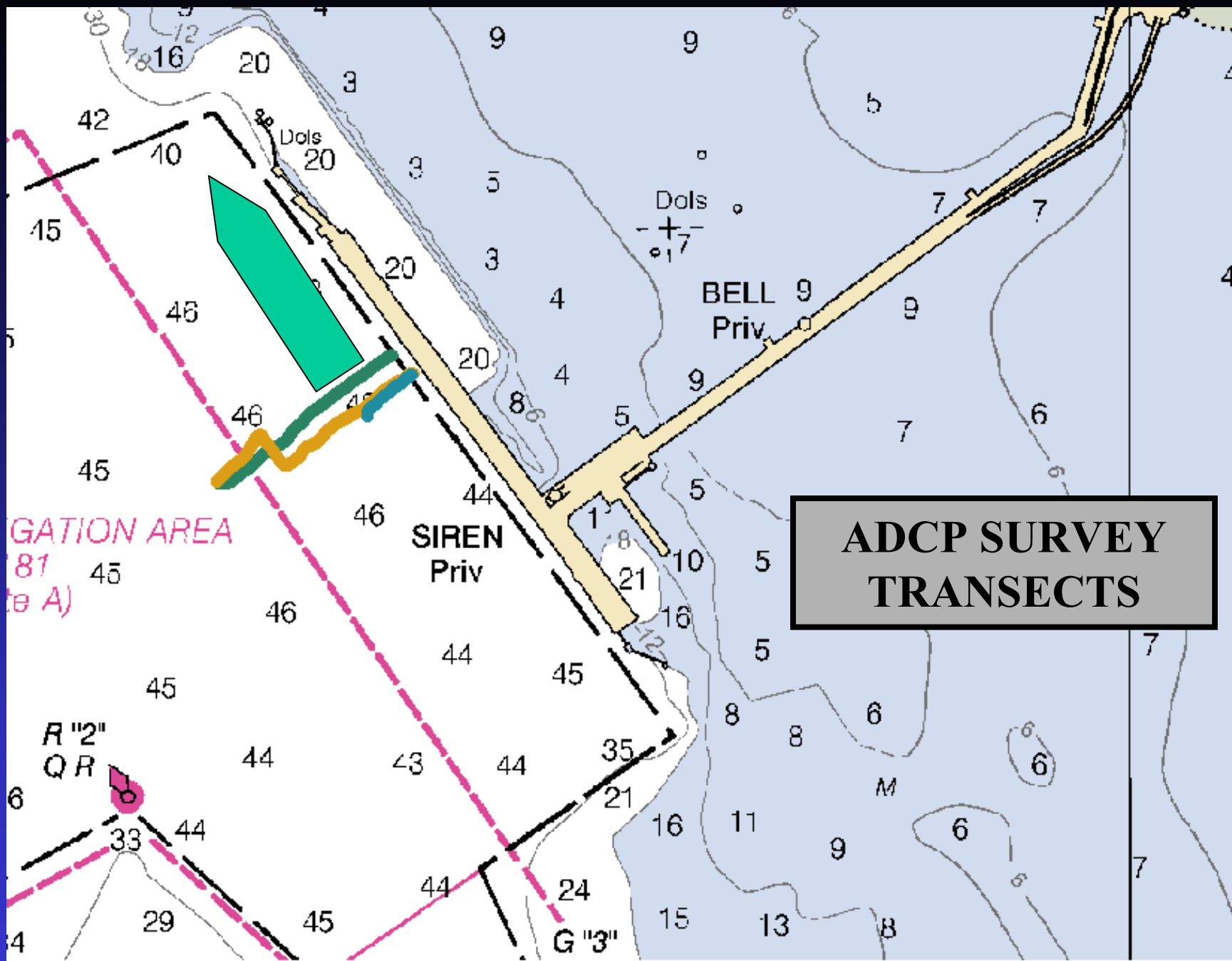
# Ambient “Outside” Survey Transects



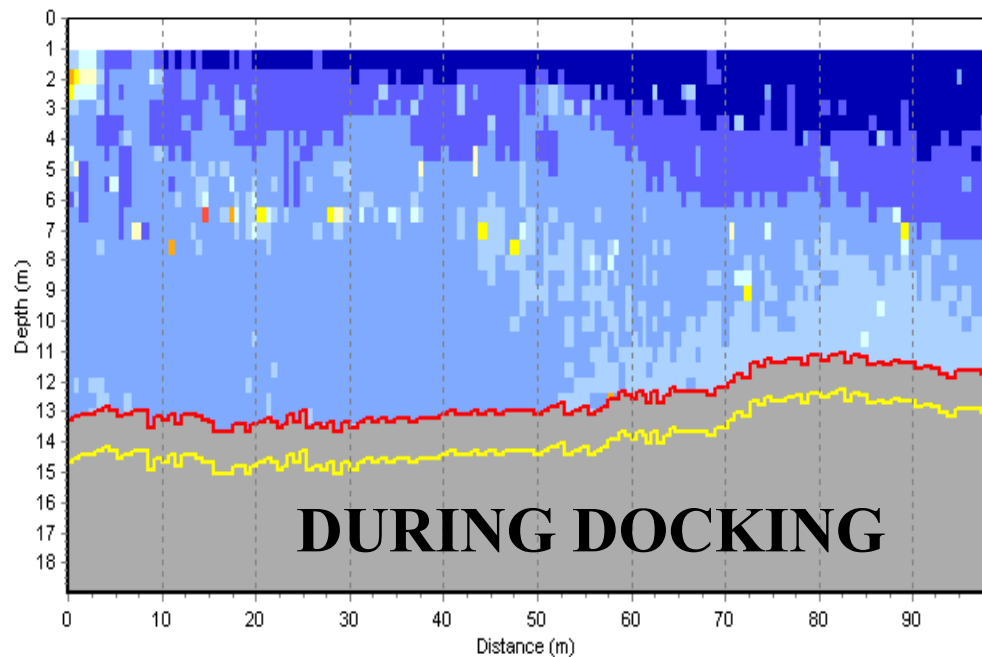
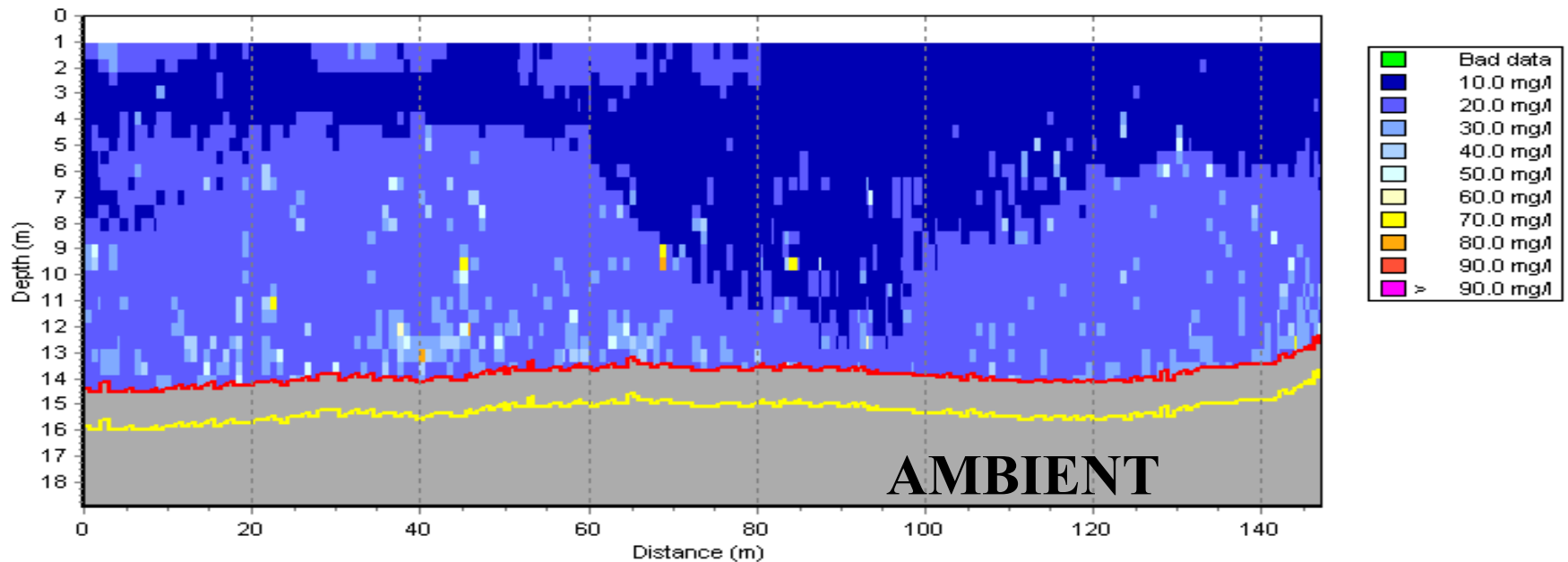




*S/R LONG BEACH*







**Vertical Profiles  
of TSS During  
Docking of the  
S/R Long Beach**





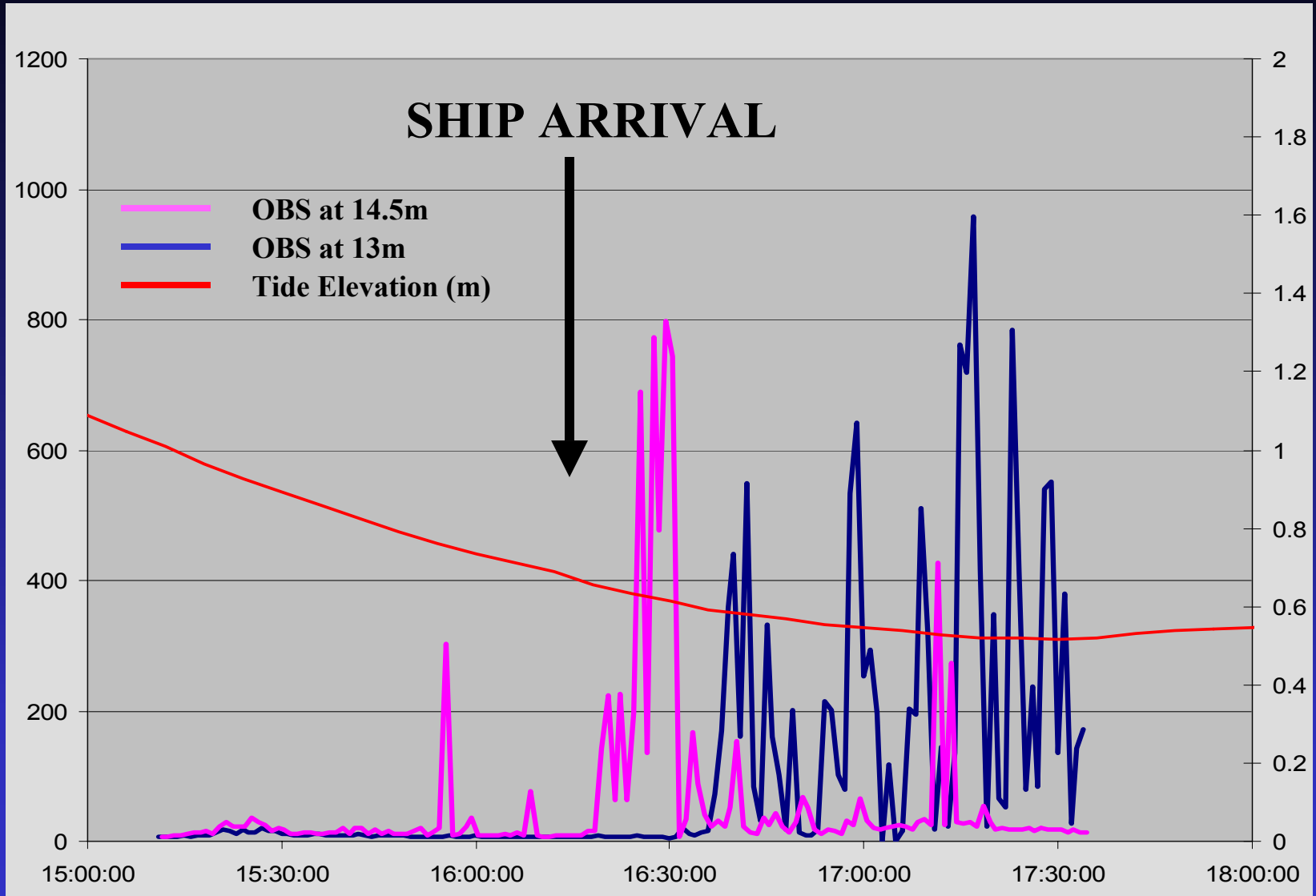
**PLUME**

**OBS UNITS**



# Turbidity During *Long Beach* Docking

Turbidity (NTU)



Tide Elevation (m) MLLW

Time

~ 75 minutes

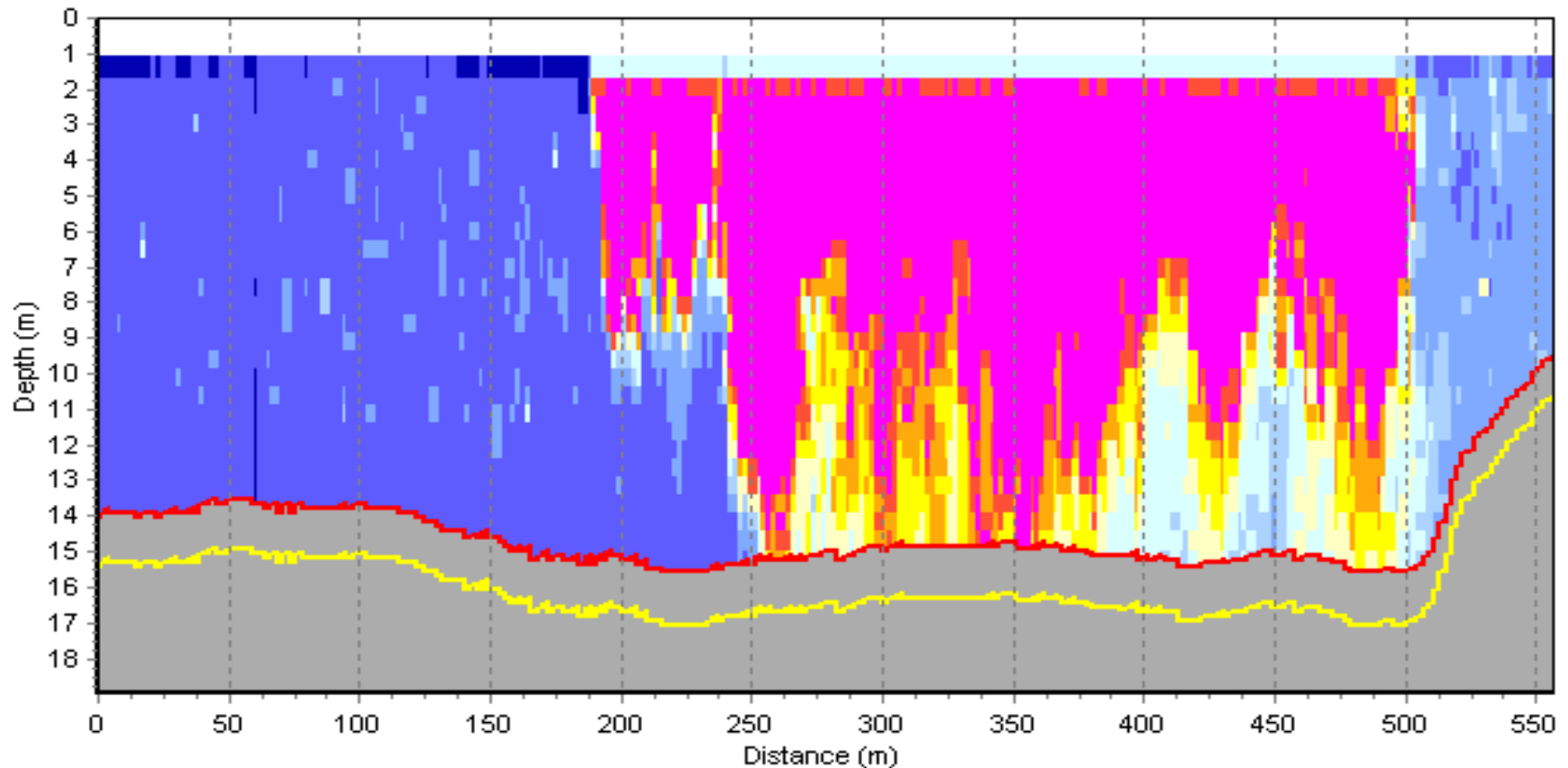
# S/R LONG BEACH DEPARTING





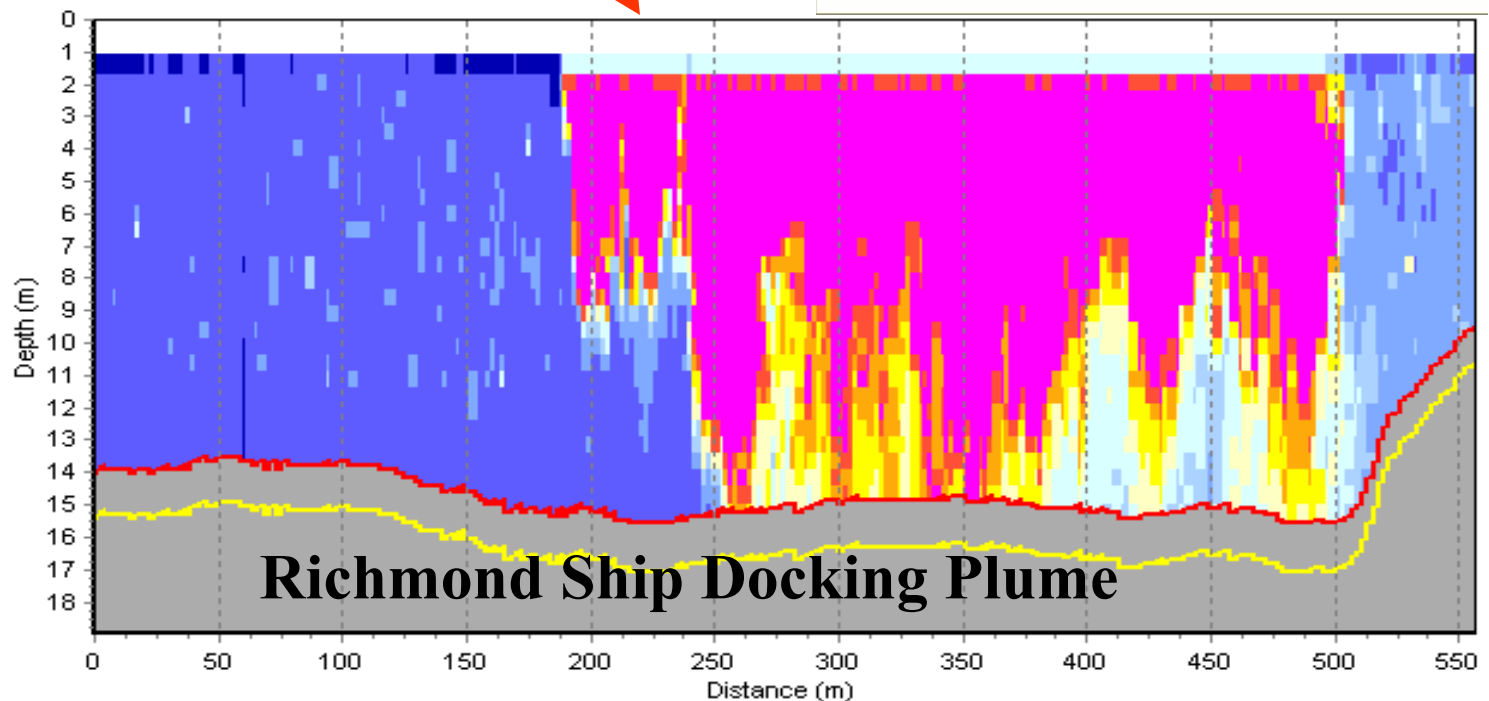
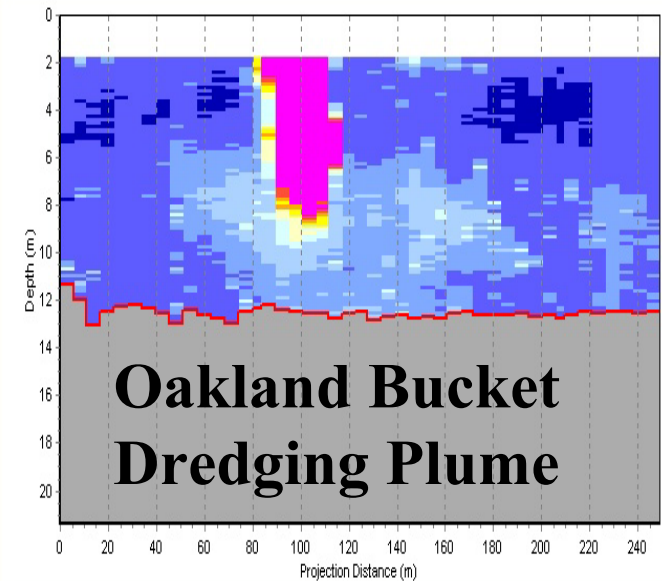


# Prop-Wash & Resuspension Astern of the *Long Beach*



~ 310 M

# SPATIAL EXTENT OF BUCKET DREDGING AND SHIP-INDUCED PLUMES





**BARGE  
TRAFFIC**

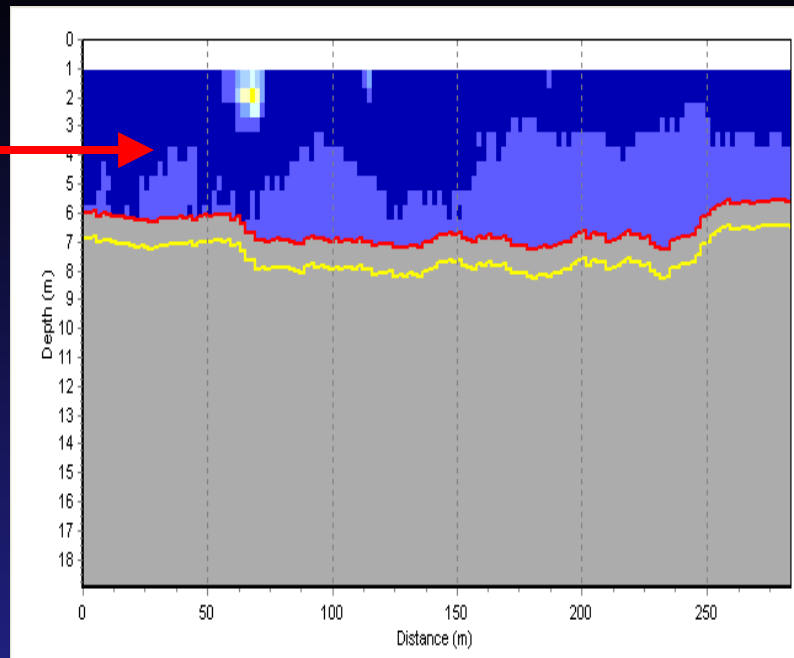


## OBS Stations

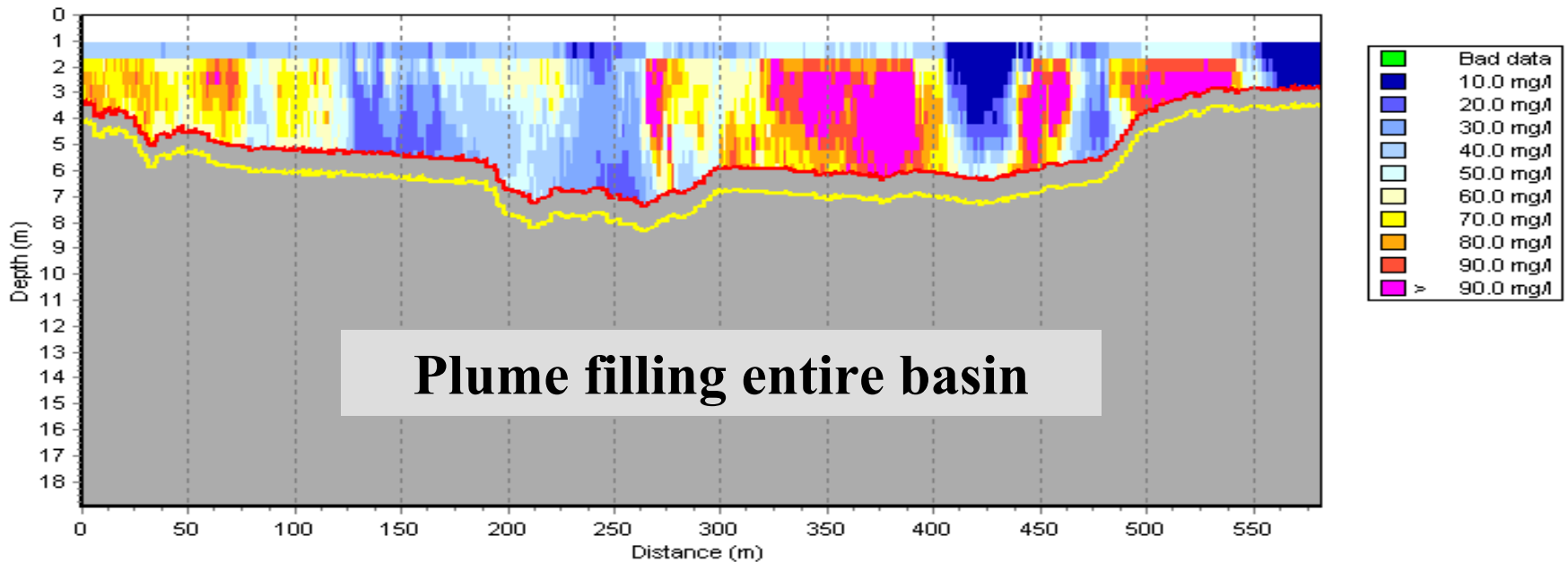




Ambient  
~ 20-30 mg/l



## Vertical Profiles of TSS During Barge Docking

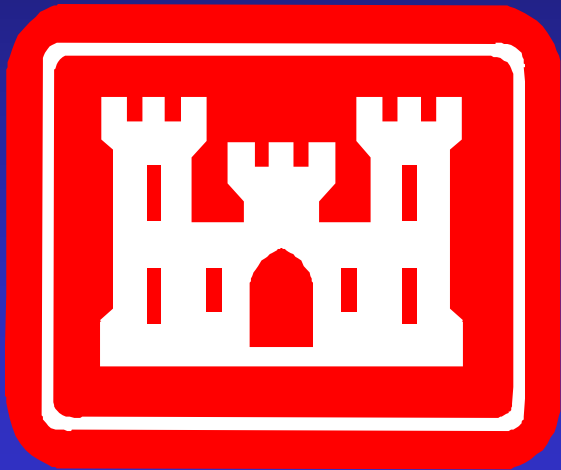




# **RICHMOND LONGWHARF FINDINGS**

- **Docking maneuvers of deep-draft vessels produced extensive plumes covering very large areas throughout the water column**
- **Docking maneuvers of barges by tugs produced large plumes of relatively high concentration**
- **Maintenance dredging may be considered a management practice that minimizes vessel resuspension**

# Characterization of Sediment Plumes During Knockdown Operations



# REDWOOD CITY KNOCKDOWN STUDY





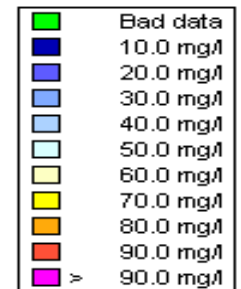
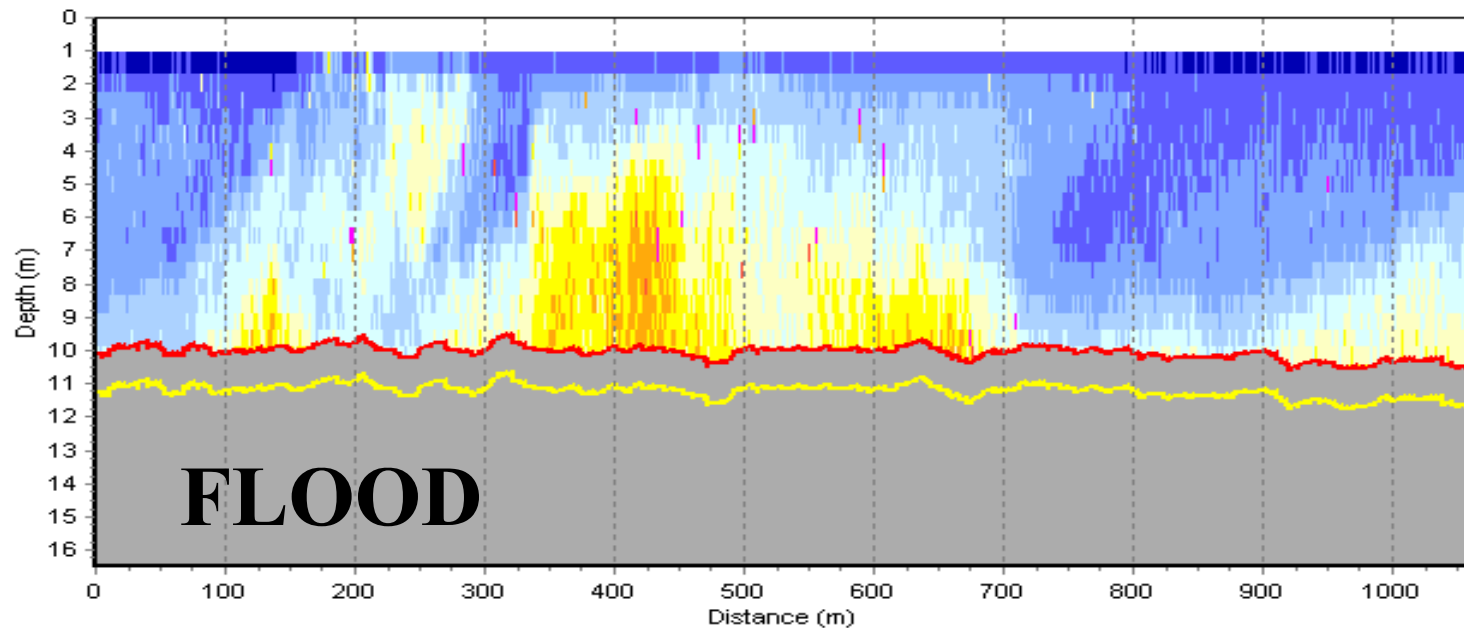
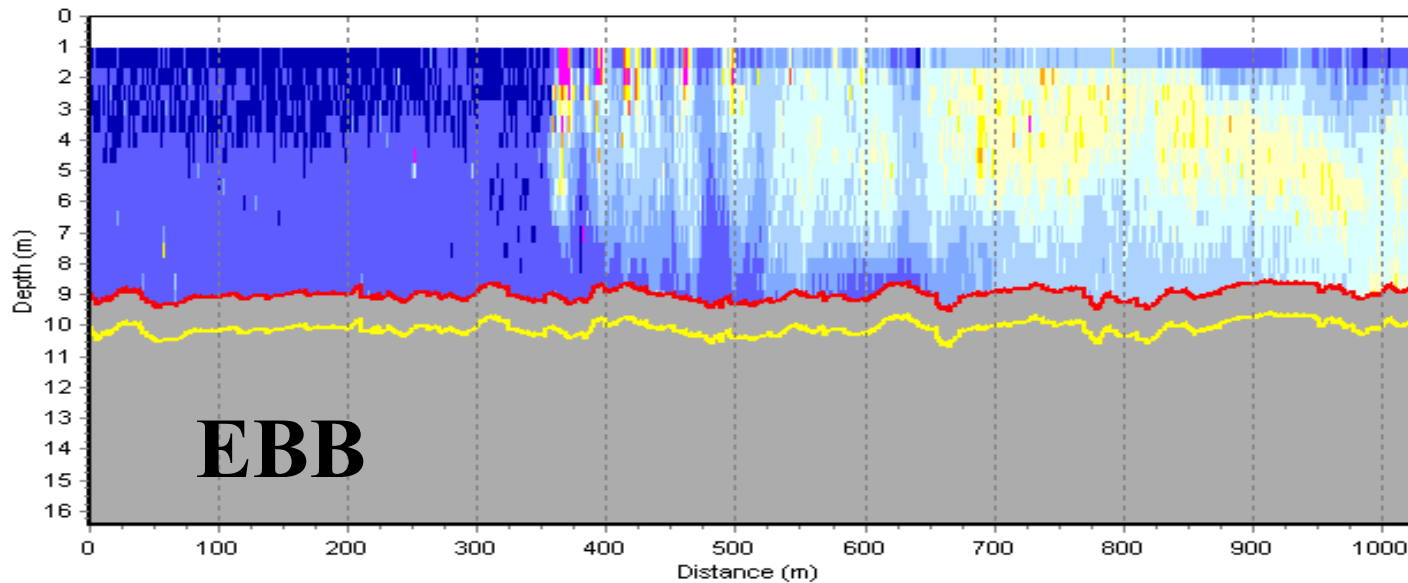


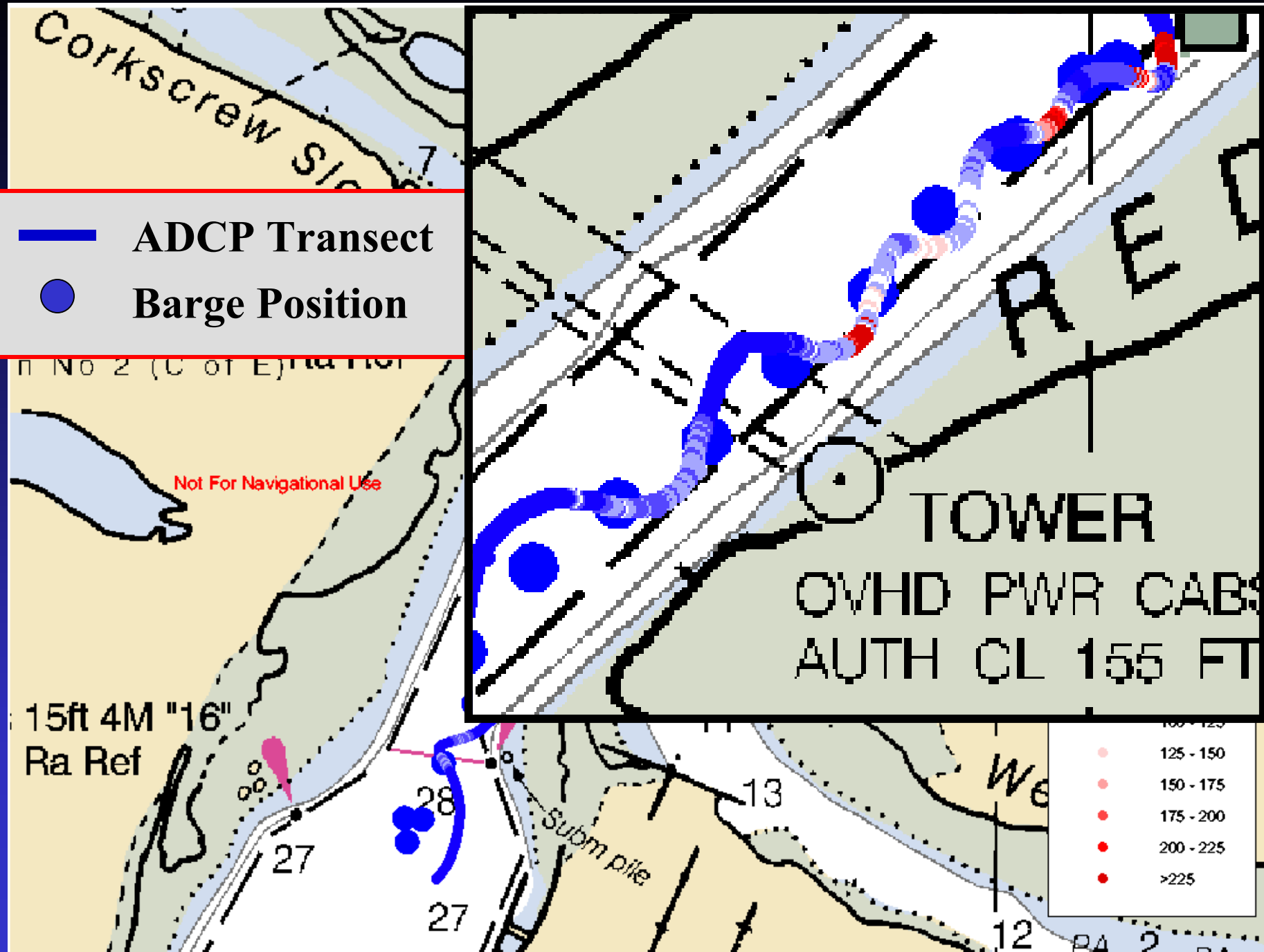






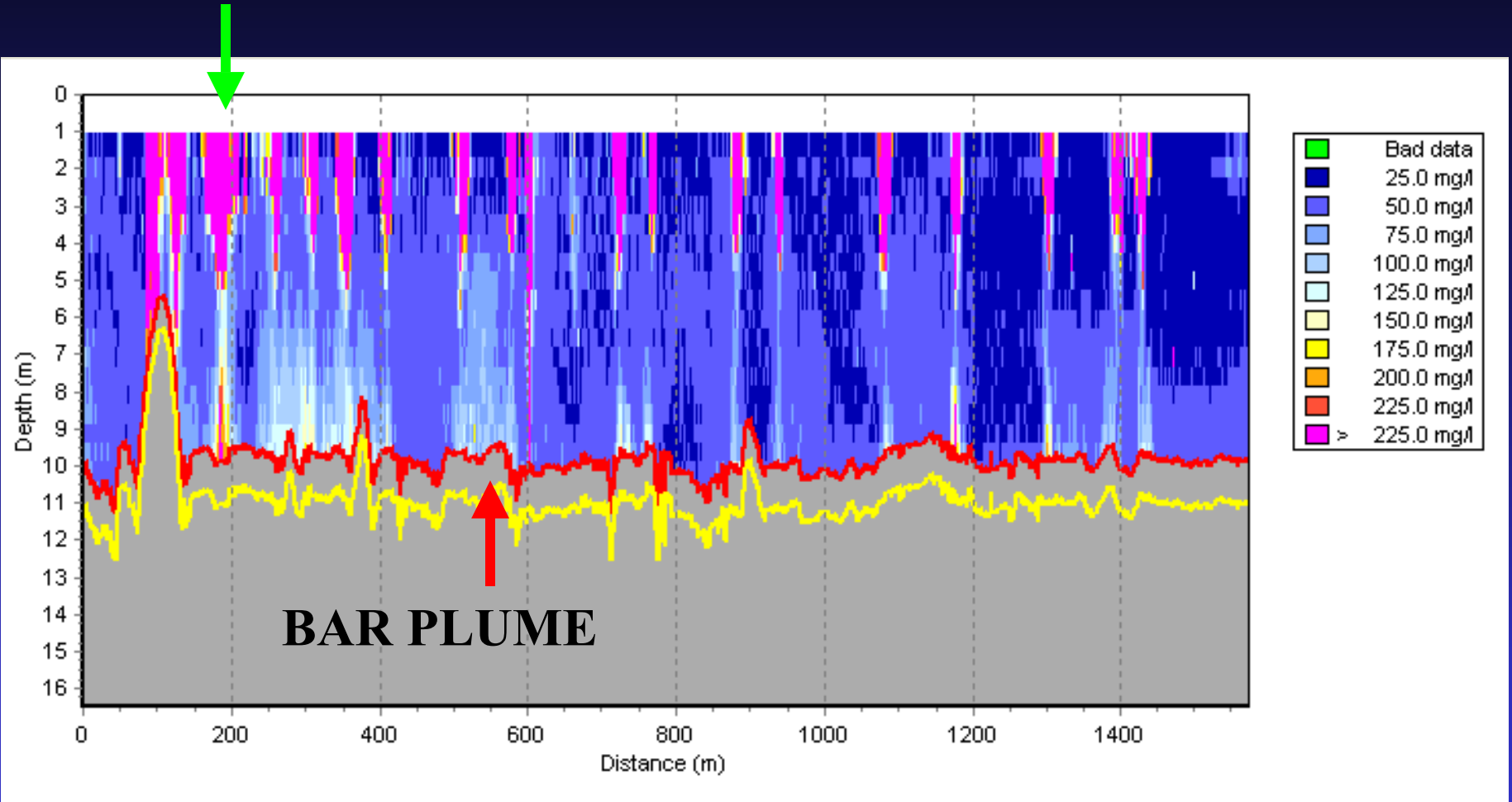
# Ambient TSS Profiles



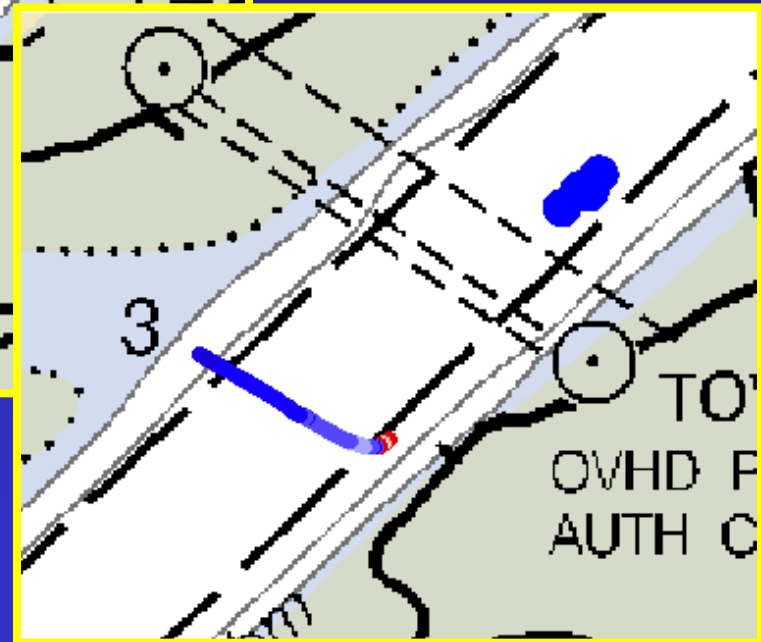
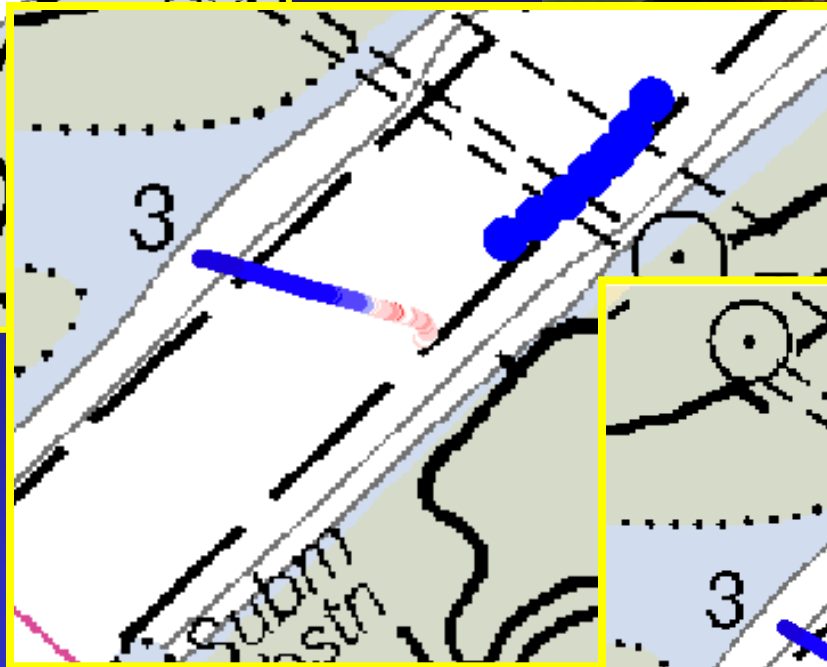
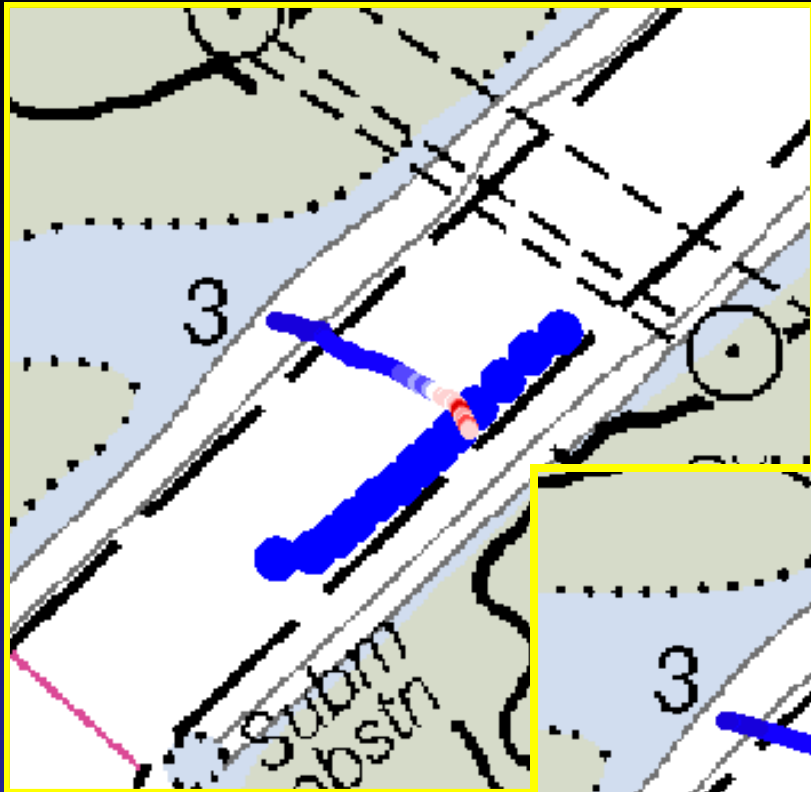


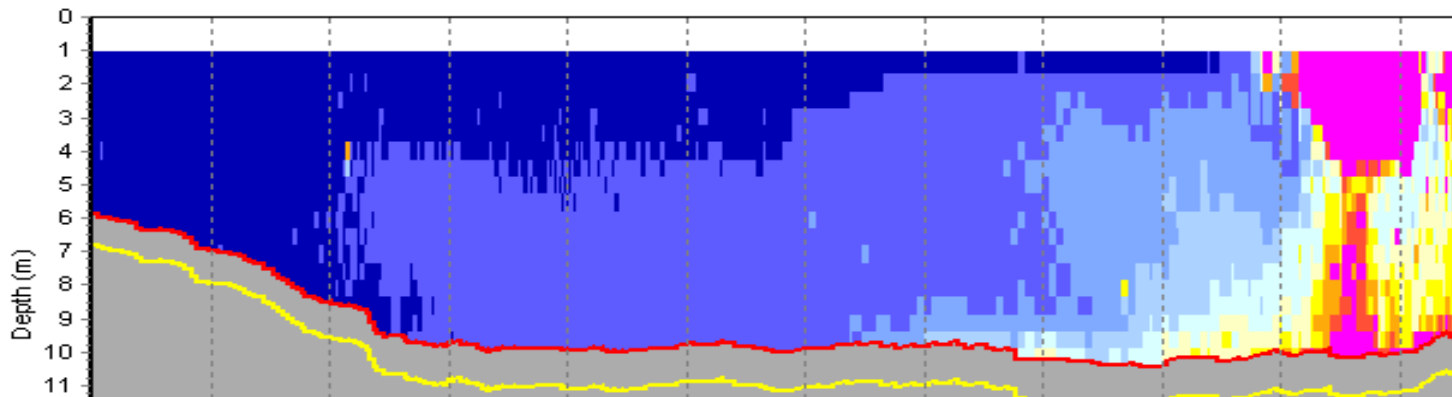
# ADCP ZIG-ZAG PROFILE

## TUG PROPWASH

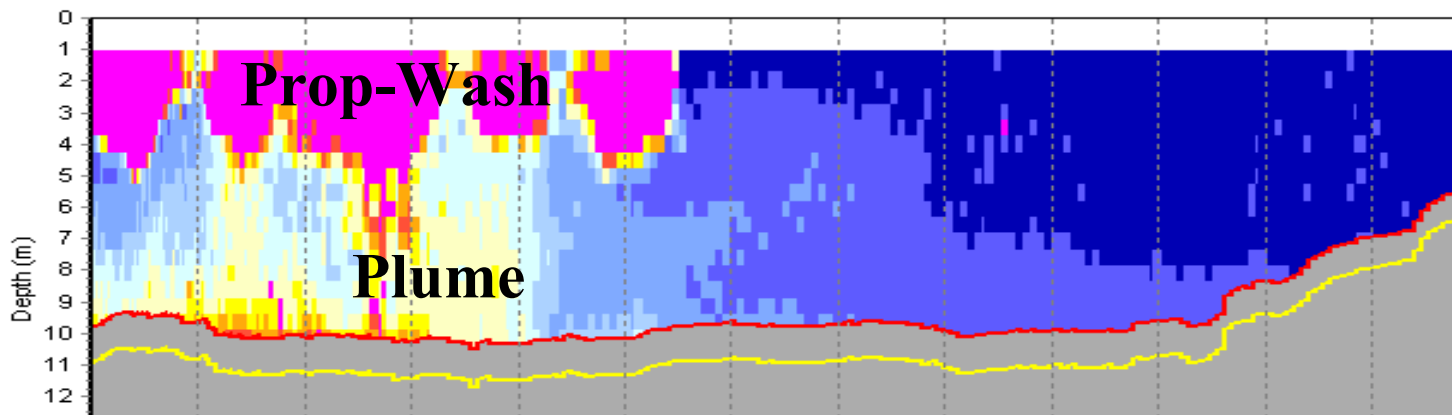




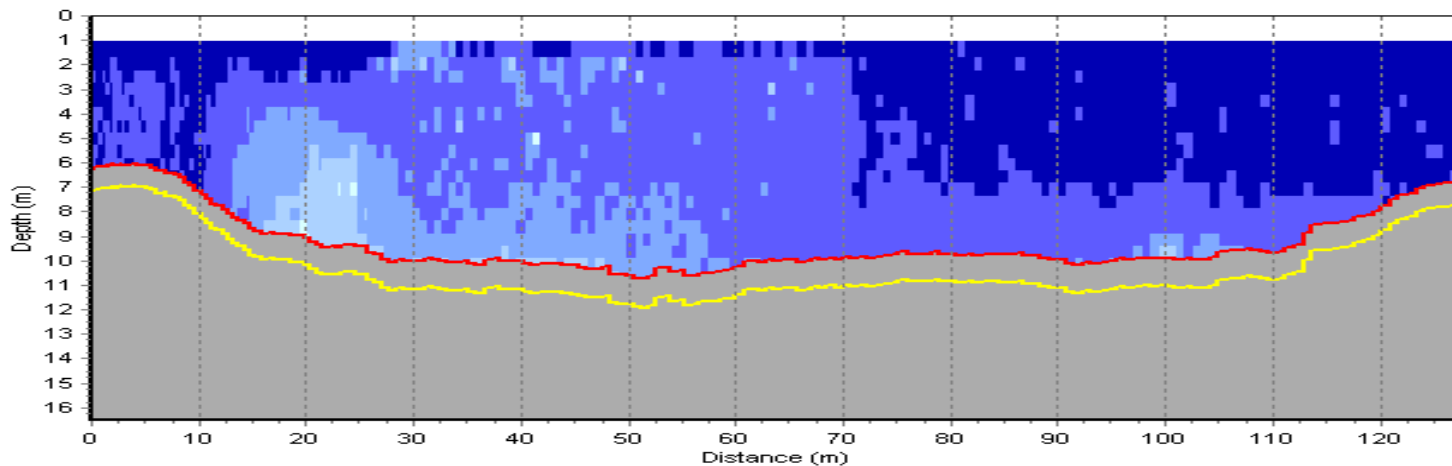




**50 M**

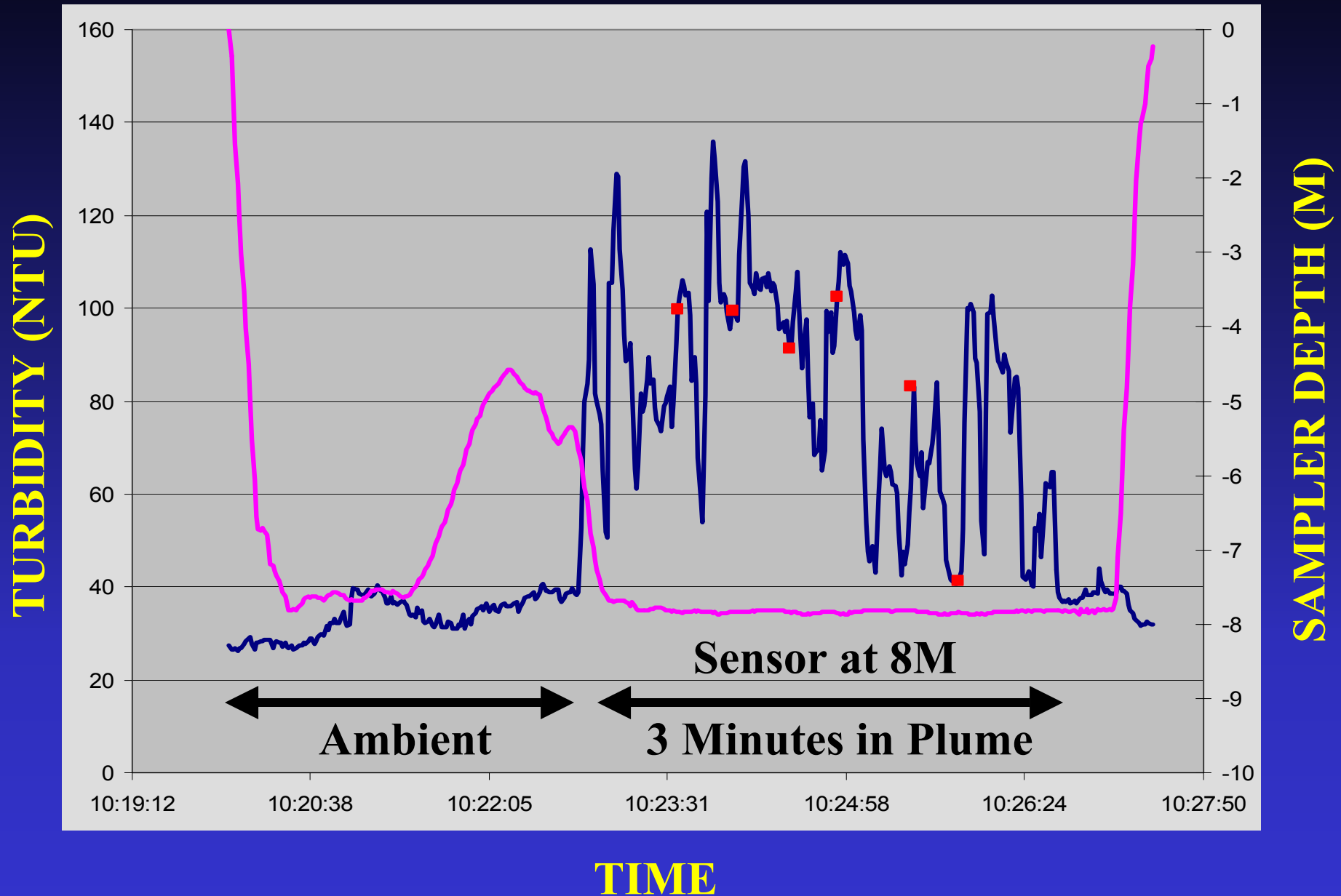


**120 M**



**220 M**

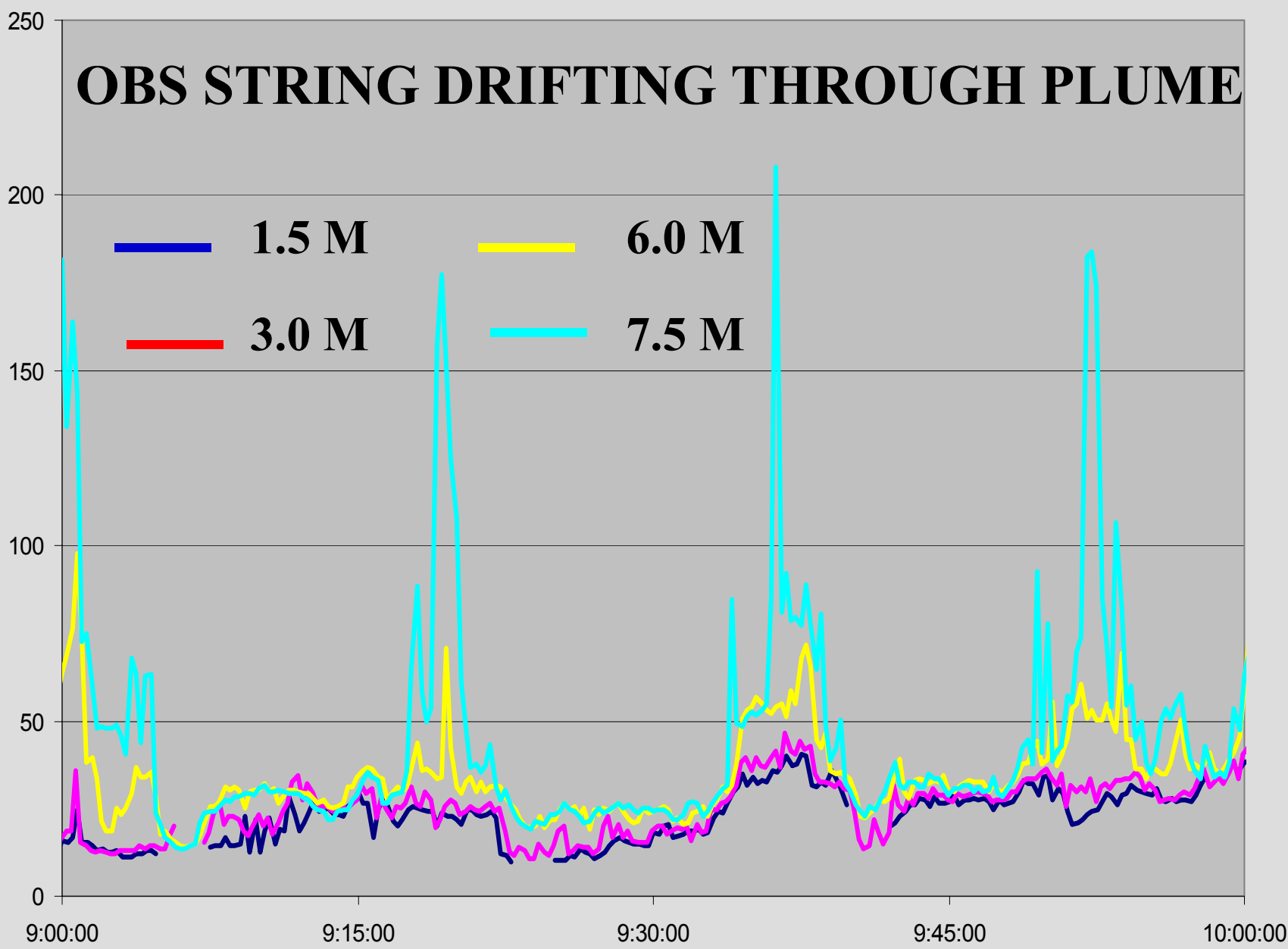
# OBS UNIT ON WATER SAMPLER



TURBIDITY (NTU)

# OBS STRING DRIFTING THROUGH PLUME

1.5 M      6.0 M  
3.0 M      7.5 M



TIME



# REDWOOD CITY FINDINGS

- **Knockdown plumes were intense but relatively small, rapidly decaying bottom features**
- **Runoff from sloughs and tidal currents produced plume-like features of equivalent concentration and larger spatial footprints**
- **Knockdown appears to be a safe, effective management practice as conducted at Redwood City**



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